



PATIENT SAFETY MANUAL

Dayananda Sagar College of Dental Sciences, Bengaluru.

Dayananda Sagar College of Dental Sciences
Kumaraswamy Layout,
Bangalore - 560 078.

DAYANANDA SAGAR OF DENTAL SCIENCES, BENGALURU.



PATIENT SAFETY MANUAL

A comprehensive concise manual prepared for coordinated Infection Control aimed at reducing/eliminating risks of infection to patients, health-care providers, visitors and community

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Dayananda Sagar College of Dental Sciences
Kumaraswamy Layout,
Bangalore - 560 078.

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Introduction

Dentists handle dangerous drugs and use advanced technical appliances (e.g. lasers, electrocautery, ionizing radiation) cause serious harm. Dentists and dental assistants come into contact with blood and body fluids that can transmit infectious diseases. Promotion of patient safety is an ethical obligation in any health care profession. Hippocratic principle promotes the principle “Primum Non Nocere” (first, do no harm). Minimize danger inherent in treatment and avoid the occurrence of any possible complications. Any dental care in which all possible risk factors can be controlled represents highest-quality dental care, and there is a clear relationship between the quality of treatment and the success of outcomes.¹ Quality assurance/improvement provide better legal security for dental practitioners.

Safety of patient and henceforth practitioner are correlated. Continuous investigations are prevailing regarding particular knowledge pertaining to accidents and complications which are associated with the use of materials, general procedures and clinical facilities.² It is multifactorial and very complex. The focus must be on the latent risks, way in which clinical information is transmitted between professionals, requirements that staff work excessively long hours and installation of floor warning sensors that becomes slippery when it is wet.³ It is a part of the non-punitive character that patient safety doesn't seek to punish the guilty.

Safety Culture

It is the product of individual and group values, attitudes, perceptions, competencies and patterns of behavior that determine the commitment to, and the style and proficiency of an organization's health and safety management.¹²⁻¹⁵ It compels us to share our experiences and data, both good and bad, with our colleagues so that everyone can learn from them. Providing a firm organization goal, mission and culture along with cores of leadership, teamwork, provision of evidence-based care, communication, learning, patient-centered. Making an institutional culture of patient safety through strategic planning, learning from errors, commitment to leadership, documenting and improving patient safety,

encouraging and practicing teamwork, spotting potential hazards and using systems for reporting and analyzing adverse events and measuring improvement.

Patient Safety in Dentistry

Applying safety measures like:

1. Educating staff regarding patient safety culture
2. Understanding our current situation
 - a. Recall and analyze adverse events encountered
 - b. Review our protocols for cleaning and sterilizing non-disposable instruments
 - d. Review our protocols for action in a life threatening emergency.
3. Devising protocols to make maneuvers and activities in potentially less dangerous criterias
4. Establishing "Safety Instructions" (red lines)
 - a. Do not perform Root Canal Treatment (RCT) without rubber dam
 - b. Never re-use containers designed for single-use.
 - c. Never prescribe any drug without consulting patient clinical record and without directly asking the patient about allergies or other health problems.
 - d. Never take a radiograph in a woman of child-bearing age without protection and without asking possible pregnancy.


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Standard Precautions

Universal precautions/ Body substance isolation

Universal precautions refers to the practice, in medicine, of avoiding contact with patients' bodily fluids, by means of the wearing of nonporous articles such as medical gloves, goggles, and face shields. The infection control techniques were essentially good hygiene habits, such as hand washing and the use of gloves and other barriers, the correct handling of hypodermic needles, scalpels, and aseptic techniques. Following the AIDS outbreak in the 1980s the US CDC formally introduced them in 1985–88. Every patient was treated as if infected and therefore precautions were taken to minimize risk.

In 1987, the practice of universal precautions was adjusted by a set of rules known as body **substance isolation**.

Standard precautions include:

- Hand hygiene or hand washing to prevent oneself from contracting an illness or disease and preventing the spread of pathogens (e.g. bacteria, viruses, parasites) to other people.
- Personal protective equipment (PPE) in cases of infectious material exposure etiquette,
- Respiratory hygiene principles,
- Patient isolation controls,
- Soiled equipment handling,
- Injection handling.



Hand Hygiene

- Hand hygiene has been cited frequently as the single most important practice to reduce the transmission of infectious agents in healthcare settings.
- It is an essential element of Standard Precautions. The term “hand hygiene” includes both handwashing with either plain or antiseptic-containing soap and water, and use of alcohol-based products (gels, rinses, foams) that do not require the use of water.
- In the absence of visible soiling of hands, approved alcohol-based products for hand disinfection are preferred over antimicrobial or plain soap and water because of their superior microbicidal activity, reduced drying of the skin, and convenience

Five Steps to Wash Your Hands the Right Way

1. Wet your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
2. Lather your hands by rubbing them together with the soap. Lather the backs of your hands, between your fingers, and under your nails.
3. Scrub your hands for at least 20 seconds. Need a timer? Hum the “Happy Birthday” song from beginning to end twice.
4. Rinse your hands well under clean, running water.
5. Dry your hands using a clean towel or air dry them.

Washing hands with soap and water is the best way to get rid of germs in most situations. If soap and water are not readily available, you can use an alcohol-based hand sanitizer that contains at least 60% alcohol.

How to Use Hand Sanitizer

1. Apply the gel product to the palm of one hand (read the label to learn the correct amount).
2. Rub your hands together.
3. Rub the gel over all the surfaces of your hands and fingers until your hands are dry. This should take around 20 seconds.

Surgical Scrub Techniques

All sterile team members should perform the hand and arm scrub before entering the surgical suite. The basic principle of the scrub is to wash the hands thoroughly, and then to wash from a clean area (the hand) to a less clean area (the arm). A systematic approach to the scrub is an efficient way to ensure proper technique.

There are two methods of scrub procedure. One is a numbered stroke method, in which a certain number of brush strokes are designated for each finger, palm, back of hand, and arm. The alternative method is the timed scrub, and each scrub should last from three to five minutes, depending on facility protocol.

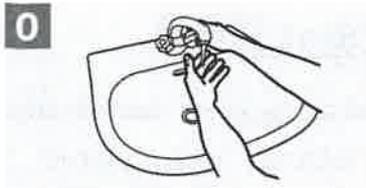
The procedure for the timed five minute scrub consists of:

- Remove all jewelry (rings, watches, bracelets).
- Wash hands and arms with antimicrobial soap. Excessively hot water is harder on the skin, dries the skin, and is too uncomfortable to wash with for the recommended amount of time. However, because cold water prevents soap from lathering properly, soil and germs may not be washed away.
- Clean subungual areas with a nail file.
- Start timing. Scrub each side of each finger, between the fingers, and the back and front of the hand for two minutes.
- Proceed to scrub the arms, keeping the hand higher than the arm at all times. This prevents bacteria-laden soap and water from contaminating the hand.
- Wash each side of the arm to three inches above the elbow for one minute.
- Repeat the process on the other hand and arm, keeping hands above elbows at all times. If the hand touches anything except the brush at any time, the scrub must be lengthened by one minute for the area that has been contaminated.
- Rinse hands and arms by passing them through the water in one direction only, from fingertips to elbow. Do not move the arm back and forth through the water.
- Proceed to the operating room suite holding hands above elbows.²

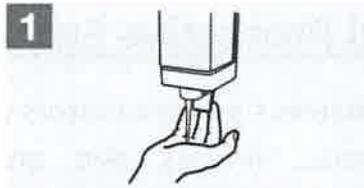
- If the hands and arms are grossly soiled, the scrub time should be lengthened. However, vigorous scrubbing that causes the skin to become abraded should be avoided.
- At all times during the scrub procedure care should be taken not to splash water onto surgical attire.
- Once in the operating room suite, hands and arms should be dried using a sterile towel and aseptic technique. You are now ready to don your gown and sterile gloves.

Characteristics of a Surgical Scrub

- Performance characteristics for a surgical scrub agent generally fall into four categories:
- 1. *Antimicrobial Action*--an ideal agent would have a broad spectrum of antimicrobial activity against pathogenic organisms. This agent would have to work rapidly. An agent that does not work rapidly may not provide adequate bacterial reduction before being rinsed off.
- 2. *Persistent Activity*--an agent offering persistent activity keeps the bacterial count low under the gloves. It is not unusual for a surgery to last in excess of two hours. Studies have shown the rate of glove failures (non-visible holes) increases with the duration of surgery.⁴ In addition, studies show bacteria grow faster under gloved than ungloved hands.^{5,6,7}
- 3. *Safety*--the ideal agent would be non-irritating and non-sensitizing. It must have no appreciable ocular or ototoxicity, be safe for use on the body, and not be damaging to the skin or environment.
- 4. *Acceptance*--probably most important to achieving compliance in using a new product is its acceptance by the healthcare worker. A product that has ideal antimicrobial action and an excellent safety profile is of little value to good infection control if the user population fails to support its use. Although each is important in its own right, all four characteristics should be present for a complete package.



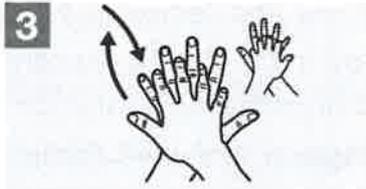
0
Wet hands with water;



1
Apply enough soap to cover
all hand surfaces;



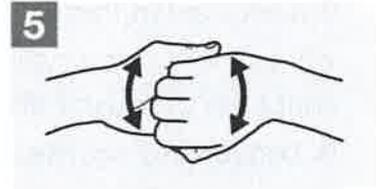
2
Rub hands palm to palm;



3
Right palm over left dorsum with
interlaced fingers and vice versa;



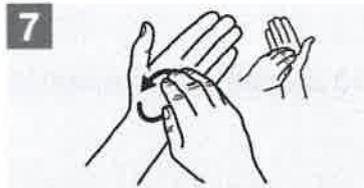
4
Palm to palm with fingers interlaced;



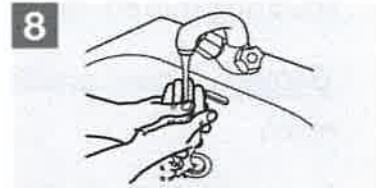
5
Backs of fingers to opposing palms
with fingers interlocked;



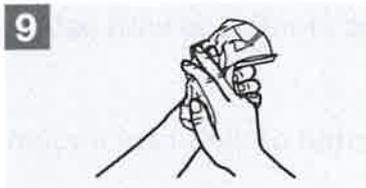
6
Rotational rubbing of left thumb
clasped in right palm and vice versa;



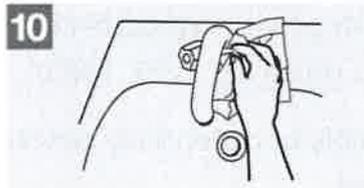
7
Rotational rubbing, backwards and
forwards with clasped fingers of right
hand in left palm and vice versa;



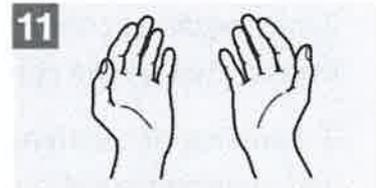
8
Rinse hands with water;



9
Dry hands thoroughly
with a single use towel;



10
Use towel to turn off faucet;



11
Your hands are now safe.


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Kumaraswamy Layout,
Bangalore - 560 078.

Personal Protective Equipment (PPE)

PPE refers to a variety of barriers and respirators used alone or in combination to protect mucous membranes, airways, skin, and clothing from contact with infectious agents. The selection of PPE is based on the nature of the patient interaction and/or the likely mode(s) of transmission. Guidance on the use of PPE is discussed in Part III. A suggested procedure for donning and removing PPE that will prevent skin or clothing contamination is presented in the Figure. Designated containers for used disposable or reusable PPE should be placed in a location that is convenient to the site of removal to facilitate disposal and containment of contaminated materials. Hand hygiene is always the final step after removing and disposing of PPE. The following sections highlight the primary uses and methods for selecting this equipment.

Gloves. Gloves are used to prevent contamination of healthcare personnel hands when

1. anticipating direct contact with blood or body fluids, mucous membranes, nonintact skin and other potentially infectious material;
2. having direct contact with patients who are colonized or infected with pathogens transmitted by the contact route e.g., VRE, MRSA, or
3. handling or touching visibly or potentially contaminated patient care equipment and environmental surfaces.

Gloves can protect both patients and healthcare personnel from exposure to infectious material that may be carried on hands. The extent to which gloves will protect healthcare personnel from transmission of bloodborne pathogens (e.g., HIV, HBV, HCV) following a needlestick or other puncture that penetrates the glove barrier has not been determined.

Isolation gowns. Isolation gowns are used as specified by Standard and Transmission-Based Precautions, to protect the HCW's arms and exposed body areas and prevent contamination of clothing with blood, body fluids, and other potentially infectious material. The need for and type of isolation gown selected is based on the nature of the patient interaction, including the anticipated degree of

contact with infectious material and potential for blood and body fluid penetration of the barrier.

Isolation gowns are always worn in combination with gloves, and with other PPE when indicated. Gowns are usually the first piece of PPE to be donned. Full coverage of the arms and body front, from neck to the mid-thigh or below will ensure that clothing and exposed upper body areas are protected. Several gown sizes should be available in a healthcare facility to ensure appropriate coverage for staff members. Isolation gowns should be removed before leaving the patient care area to prevent possible contamination of the environment outside the patient's room. Isolation gowns should be removed in a manner that prevents contamination of clothing or skin (Figure). The outer, "contaminated", side of the gown is turned inward and rolled into a bundle, and then discarded into a designated container for waste or linen to contain contamination.

Face protection: masks, goggles, face shields

Masks. Masks are used for three primary purposes in healthcare settings:

1. placed on healthcare personnel to protect them from contact with infectious material from patients e.g., respiratory secretions and sprays of blood or body fluids, consistent with Standard Precautions and Droplet Precautions;
2. placed on healthcare personnel when engaged in procedures requiring sterile technique to protect patients from exposure to infectious agents carried in a healthcare worker's mouth or nose, and
3. placed on coughing patients to limit potential dissemination of infectious respiratory secretions from the patient to others (i.e., Respiratory Hygiene/Cough Etiquette).

Masks may be used in combination with goggles to protect the mouth, nose and eyes, or a face shield may be used instead of a mask and goggles, to provide more complete protection for the face, as discussed below. Masks should not be confused with particulate respirators that are used to prevent inhalation of small particles that may contain infectious agents transmitted via the airborne route as described below.

Two mask types are available for use in healthcare settings: surgical masks that are cleared by the FDA and required to have fluid-resistant properties, and procedure or isolation masks⁷⁵⁸ #2688. No studies have been published that compare mask types to determine whether one mask type provides better protection than another. Since procedure/isolation masks are not regulated by the FDA, there may be more variability in quality and performance than with surgical masks. Masks come in various shapes (e.g., molded and non-molded), sizes, filtration efficiency, and method of attachment (e.g., ties, elastic, ear loops). Healthcare facilities may find that different types of masks are needed to meet individual healthcare personnel needs.

Goggles, face shields. Guidance on eye protection for infection control has been published. The eye protection chosen for specific work situations (e.g., goggles or face shield) depends upon the circumstances of exposure, other PPE used, and personal vision needs. Personal eyeglasses and contact lenses are NOT considered adequate eye protection

The role of goggles, in addition to a mask, in preventing exposure to infectious agents transmitted via respiratory droplets.

Disposable or non-disposable face shields may be used as an alternative to goggles. As compared with goggles, a face shield can provide protection to other facial areas in addition to the eyes. Face shields extending from chin to crown provide better face and eye protection from splashes and sprays; face shields that wrap around the sides may reduce splashes around the edge of the shield.

Removal of a face shield, goggles and mask can be performed safely after gloves have been removed, and hand hygiene performed. The ties, ear pieces and/or headband used to secure the equipment to the head are considered “clean” and therefore safe to touch with bare hands. The front of a mask, goggles and face shield are considered contaminated.

Cleaning of Miscellaneous areas in hospitals

Cleaning of Water coolers / drinking water facilities

1. Water coolers must be kept clean and covered at all times. They must be emptied completely at least once a month and the tank cleaned. The water should ideally be filtered through a purifier. There should be drainage for the spill over.
2. The area surrounding must be kept dry.
3. The electric wire and plugs must be checked monthly to ensure that they are in good condition.

Desert coolers and air conditioners

1. Desert coolers should be emptied every week to prevent mosquito breeding.
2. Drainage should be provided for the spill over of water.
3. The electric wire and plugs must be checked monthly to ensure that they are in good condition.
4. Air conditioners should be cleaned every month. The electric wire and plugs must be checked monthly to ensure that they are in good condition.

Generator / engineering rooms

1. The generator / engineering room must be swept dry on a daily basis. Oil spills are common here and should be cleaned by sprinkling dry mud on the spill and then scraping the mud and disposing it by burial.
2. Cleaning with water if done should be after ensuring that the electricity has been switched off and that no water splashes on to the electrical and motor parts.

Ambulance / patient transport

1. The ambulance or patient transport vehicles must be cleaned daily and after each patient evacuation. It must be cleaned if it has been used to carry a dead body / a case of infectious disease.

2. Park the ambulance away from the public area and switch off the motor / AC. Open the doors and windows.
3. Remove all curtains and equipment and keep in a secure area. Curtains are washed once in a month. Equipment to be dusted and surface cleaned with a wet cloth ensuring that no water enters the equipment and damage them during the cleaning process.
4. Inside dusting followed by clean damp mopping should be practiced. In case of body fluid spills, wash the vehicle with soap and water and allow to dry.
5. Freshly prepared 0.5% chlorine/ 70% isopropyl alcohol solution can be used to disinfect the inside of the ambulance especially if an infected case had been carried.
6. Special care must be taken that the electronic and other medical equipment are not damaged during the cleaning process.
7. Allow it to dry, keeping the doors and windows open.
8. Replace all equipment and curtains.

Cleaning of lifts

1. Lifts are maintained by the Maintenance Department but operated by the Housekeeping staff.
2. Clean the lifts by sweeping and wet mopping every evening. The lifts can be washed and cleaned every week / month depending on the usage and dirt accumulated. Cleaning is done by wet mopping and then being allowed to dry. The walls of the lift must be cleaned with a wet cloth and allowed to dry.
3. Cleaning in case of transfer of infected patient or body fluids spills :
 1. The lift should be shut for use by the public / staff whenever an infected patient is transported. It should be washed with soap and water and after drying then mopped / swiped with freshly prepared 0.5% chlorine.
 2. In case of body fluid spills , a newspaper or blotting paper should be placed over the spill to absorb the same. Freshly prepared 5%

hypochlorite solution is then sprinkled over this. This should then be scooped up and the area swept clean. The material scooped up will then be disposed of as infectious waste.

Cleaning of water tanks

1. Water tanks should be cleaned once every quarter.
2. The Tanks must be emptied completely. The inside of the tank should be scrubbed with detergent / soap and water with a brush and then repeatedly rinsed / flushed with water to ensure that the detergent / soap has been washed away. Special care must be taken of cleaning of the corners and joints to ensure that the soap / dirty water do not remain. The tank is allowed to dry before filling and reusing the tank.
3. If the tank was found to be very dirty with a lot of algae and sediment then the tank is should be disinfected by using chlorine. After allowing an exposure time of 1 hour the tank should be emptied and flushed with normal water to remove the residual chlorine.


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Kumaraswamy Layout,
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Dental Chair Cleaning

The CDC advocate the use of impervious, disposable barriers on dental chair surfaces and should be changed between patients. Aside from being a precautionary measure, this will help maintain the appearance and finish of the equipment and ensure durability and maximum lifespan of its surfaces. If the barrier was compromised or contaminated, it must be replaced immediately. Cleaning and disinfection after every patient is also highly recommended. If you see visible contamination, a hospital grade disinfectant should be used.

Disinfectants to Use for Dental Chairs

- Quarternary ammonium compounds (QUATS)
- High-dilution water-based phenolic compounds
- QUATS plus less than 25% alcohol by volume

Unacceptable Disinfectants

These chemicals can harm the surface finishes of a dental chair; hence not recommended. Take note of these when shopping for a disinfectant.

- Ethyl alcohol or isopropyl alcohol greater than 25% by volume
- Hydrogen peroxide
- Chlorine compounds like sodium hypochlorite
- Strong phenols or phenol-alcohol combinations
- Sodium bromide
- Citric acid
- Iodophors or iodine compounds
- Ammonium hydroxide or ammonia
- Most household cleaners

Do not forget to use the appropriate personnel protective equipment such as gowns gloves, and masks as and when required during disinfecting dental chairs.

How to Disinfect a Dental Chair with Stains?

The longer a stain is allowed to set, the more difficult it will be to clean. Use any of the recommended disinfectants above for convenient everyday dental chair cleaning. Their formulation is gentle and safe for use on upholsteries.

Alternatively, you can prepare a solution of 10% household liquid non-ionic dish mixed with warm water. Apply it using a soft damp cloth to remove most soiling. Re-dampen the cloth until all remaining residues are completely removed. Wipe the surface with a clean water-dampened fabric.

For hard to remove stains, you may do the following techniques:

- Using a soft white cloth with a standard 70% formulation of Isopropyl alcohol, rub an inconspicuous area of the dental chair first. Make sure that that there will be no discoloration. Then, rub the stained area gently at least 6 times. Be very careful with this technique. Complete only in a well-ventilated area and away from any open flame. Rinse with a water-dampened cloth.
- Mild abrasions may be needed to remove stains. Try using a micro-fiber cloth with water and mild abrasive. Bristle brushes or scouring pads will damage the upholstery.

In addition, maintaining for the upholstery on the chair itself, it is important to care for and disinfect other attachments on the dental chair.

Disinfection Schedule

Part of knowing **how to disinfect a dental chair** properly is the schedule. Below is a general guideline for most brands.

After Every Patient or Treatment

Rinse, clean, and disinfect the following after every patient or treatment:

- Suction system and tubes
- Water supply system and instrument tubes

- Surfaces, upholstery, and instrument tubes
- Handles at dentist element
- Operating light
- Spittoon and filter cover

Every Morning

Every morning before accepting patients, the following must be rinsed and cleaned:

- Water supply system and instrument tubes
- Suction system and tubes
- Spittoon

Every Evening

At the end of each day, the following must be rinsed, cleaned, and disinfected:

- Water supply system and instrument tubes
- Suction system, tubes, hose connectors, and filter inserts
- Spittoon

As Needed

- Control return air filter of turbine
- Clean and replace silicone pads
- Clean and disinfect cup filler and cup rest
- Clean and disinfect instrument holder
- Change the amalgam separator

Weekly or After a Long Downtime

- Clean and disinfect instrument tubes, water supply system, suction system, and spittoon

Needle stick injury

Injuries from needles used in medical procedures are sometimes called needle-stick or sharps injuries.

Sharps can include other medical supplies, such as syringes, scalpels and lancets, and glass from broken equipment.

If you pierce or puncture your skin with a used needle, follow this first aid advice immediately:

- Encourage the wound to bleed, ideally by holding it under running water
- Wash the wound using running water and plenty of soap
- Do not scrub the wound while you're washing it
- Do not suck the wound
- Dry the wound and cover it with a waterproof plaster or dressing

You should also seek urgent medical advice as you may need treatment to reduce the risk of getting an infection:

- Contact your employer's Occupational Health service if you injure yourself at work
- Follow post exposure prophylaxis as advised by the physician



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FIRST AID IN CASE OF NEEDLE STICK INJURY

STOP THE PROCEDURE IMMEDIATELY

WASH THE AREA WITH SOAP & WATER
DO NOT SQUEEZE OR SUCK THE AREA

INFORM STAFF/ DEPARTMENT NURSE

FILL THE NEEDLE STICK INJURY FORM

GIVE BLOOD SAMPLE FOR HIV, HBsAG & HCV FOR BASELINE
TESTING

FOLLOW POST EXPOSURE PROPHYLAXIS AS ADVISED BY THE
PHYSICIAN

Prepared by Dr Rayan M

Floor Cleaning

Different areas require different levels of cleanliness, e.g. the OPD and waiting areas do not require a very high level of cleanliness as compared to that of the Operation theatre.

Preparation

1. Put gumboots or disposable shoe covers
2. Hand-Gloves must always be borne by all personnel engaged in cleaning of Health Facility
3. Wear cap, mask, apron / gown
4. Follow the manufacturer's instructions for proper dilution and contact time for cleaning and disinfecting solutions.
5. Gather materials required for cleaning before entering the room
6. Visibly check and ensure all cleaning equipment itself is clean
7. Remove clutter before cleaning
8. Move cots and furniture as per the directions of the supervisor to one side.

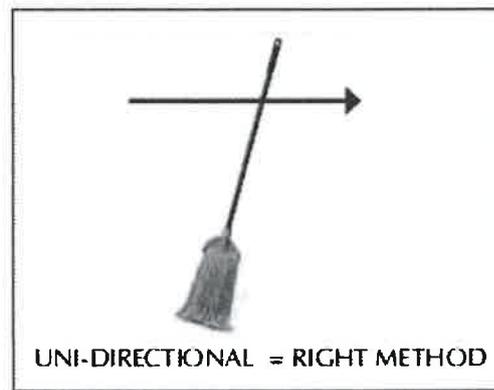
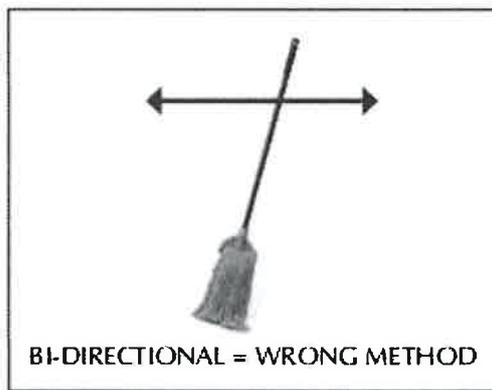
During Cleaning

1. Progress from the least soiled areas to the most soiled areas and from high surfaces to low surfaces.
2. Remove gross soil (visible to naked eye) prior to cleaning and disinfection.
3. Minimise turbulence to prevent the dispersion of dust that may contain micro-organisms.
4. Never shake mops
5. Use dust control mop prior to wet/damp mop. Do not use brooms.
6. Wash the mop under running water before doing wet mopping .

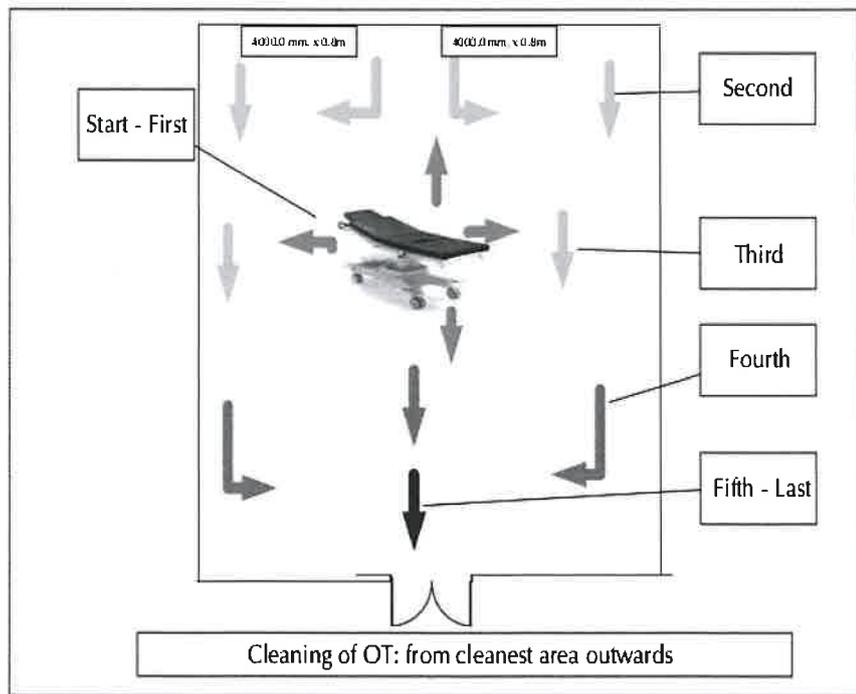
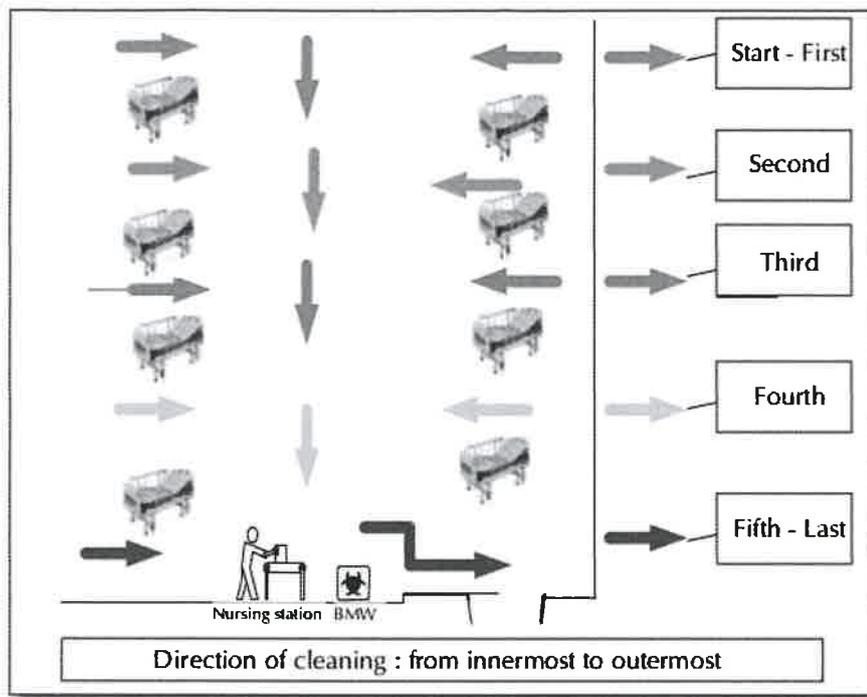
7. Do not 'double-dip' mops (dip the mop only once in the cleaning solution, as dipping it multiple times may re-contaminate it).
8. An area of 120 square feet to be mopped before re-dipping the mop in the solution.
9. Cleaning solution to be changed after cleaning an area of 240 square feet (This does not apply to critical areas like OT and ICU).
10. Change more frequently in heavily contaminated areas, when visibly soiled and immediately after cleaning blood and body fluid spills.
11. Be alert for needles and other sharp objects. Safely handle and dispose sharps into puncture proof container. Report incident to supervisor
12. Collect waste, handle plastic bags from the top (do not compress bags with hands)
13. Clean hands on leaving the room.

Direction of cleaning

☐ The sweeping movement should be unidirectional



☐ The direction of cleaning in healthcare facilities must be from the clean to the dirty area. In closed spaces like a ward the direction should be from within outwards.



1. Clean the furniture and cot castors with a clean duster using the germicidal solution prepared in the plastic pail, directly or with a spray bottle.
2. Put the tables and cots back in position.

3. Take out all your cleaning equipment and tools out of the door
4. Scan the room to ensure that cleaning is done thoroughly and none of personal belonging / cleaning equipment left behind in the operation room.
5. Keep your equipment and tools to designated place, after rinsing in fresh germicidal solution.
6. Remember to clean the door stoppers and the door handles and latches which are usually left or not attended to.

After cleaning

1. De-gown carefully, wash and let them dry.
2. Remove your cap and mask wash and let them dry.
3. Remove the gloves wash and let them dry.
4. Wash your hand as per standard procedure

Practical suggestions

1. All loose particles and litter should be removed before dealing with any stubborn stains/dirt.
2. Use lighter cleaning methods before attempting stronger methods.
3. Before any implement or cloth is used, make sure they are clean and dry.
4. If possible, use a **double bucket system** when mopping the floors so that dirty water is not reused while mopping. The first bucket contains clean water while the second bucket is used to squeeze out the water from the dirty mop following which the mop is dipped in the clean water and mopping done.
5. The **Three bucket system** should be ideally practised and that the first bucket contains water with detergent used in the beginning. The mop is then rinsed in the second bucket and dipped in the third bucket which can also contain a disinfectant and the mopping done again.
6. Abrasives should be used as a last resort as they can damage the surface.
7. Use an agent that is least offensive in smell if alternatives are available.

8. When cleaning a surface, be cautious of marring the surroundings area, e.g. finger prints on walls, grazing other articles, etc.
9. Use methods that are least inconvenient to patients. Disturbance can be caused by noise or obstacles placed in public areas.
10. Be sure that during the process of cleaning areas do not become accident-prone, e.g. wet, slippery floors, etc. If required, cautionary sign can be put.
11. Cleaning should be carefully planned to make efficient use of time.

There is often spill of body fluids & mercury in Health Facilities. Such spillage requires careful cleaning and disinfection. Safety precautions are of utmost importance for the staff and visitors.


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Handling of Mercury Spills

In the event of any mercury spillage due to breakage of instrument the following measures are to be taken: -

• **Do's**

- Remove people and pets from the spill area.
- Close all interior doors to the spill area.
- Turn off heating and air conditioning systems.
- Open all exterior windows and doors.

• **Don'ts**

- Remove people and pets from the area. Do not touch the mercury. Never vacuum; it will release mercury vapour into the air.
- Never use a broom; it will break up the mercury.
- Never pour mercury down the drain.
- Never walk around in contaminated clothing or shoes.
- Never put mercury-contaminated items in the washing machine.

Clean-up Instructions – Mercury Spill Management

- **Evacuate area** : As far as possible, keep people who are not involved in the clean-up away from spill area to limit exposures and to prevent the spread of contamination.
- **Put on face mask** : In order to prevent breathing of mercury vapour, wear a protective face mask as suggested in the component of the spill kit.
- **Remove Jewellery** : Remove all jewellery from hands and wrists so that the mercury cannot combine (amalgamate) with the precious metals.
- **Wear gloves** : Put on rubber or latex gloves. If there are any broken pieces of glass or sharp objects, pick them up with care. Place all broken objects on a paper towel, fold the paper towel and place in a puncture proof plastic bag

or container provided with lid. Secure the plastic bag/container and label it as containing items contaminated with mercury.

- **Locate mercury beads :** Locate all mercury beads and look for mercury in any surface cracks or in hard-to-reach areas of the floor. Check a wide area beyond the spill. Use a flashlight to locate additional glistening beads of mercury that may be sticking to the surface or in small cracked areas. Cardboard sheets should be 'used to push the spilled beads of mercury together'
- **Use syringe without a needle/eyedropper and sticky tape :** A syringe (without needle) shall be used to suck the beads of mercury. Collected mercury needs to be placed slowly and carefully into an unbreakable plastic container/glass bottle with an airtight lid half filled with water. After removing larger beads, use sticky tape to collect smaller hard-to-see beads. Place the sticky tape in a puncture proof plastic bag and secure properly.
- Commercially available powdered sulphur or zinc stains make mercury a darker colour which makes smaller beads easier to see (powder sulphur may be used because (i) it makes the mercury easier to see since there may be a colour change from yellow to brown and (ii) it binds the mercury so that it can be easily removed and suppresses the vaporisation of any missing mercury).

Collection in leak-proof bag or container

Place all the materials used during the clean-up, including gloves, mercury spills collected from the spill area into a leak-proof plastic bag or container with lid and seal properly and label as per these guidelines. Such collected waste should be stored in a designated area only.

Cleaning of the floor surfaces contaminated with mercury and cleaning of room surfaces

Sprinkle sulphur or zinc powder over the area which will quickly bind any remaining mercury. In case, zinc powder is used, moisten the powder with water after it is sprinkled and use a paper towel to rub it into cracks in the flooring. Use the cardboard and then dampened paper towels to pick up the powder and bound

mercury. Place all towels and cardboard in a plastic bag and seal all the bags that were used and store in a designated area.

All the mercury spill surfaces should be decontaminated with 10% sodium thiosulfate solution. Keep a window open to ventilate after the clean-up. After ensuring all the mercury has been removed, resume normal vacuuming and utilise the cleaned area for routine operation.

Labelling

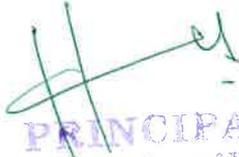
All the bags or containers containing items contaminated with mercury should be marked properly and labelled with following details: "Hazardous Waste, Handle with Care", date of storage/generation, name and address of the hospital along with the contact number.

Storage

Following points should be considered for storage of mercury bearing waste within the HCFs: The storage place should be away from heat generating equipment. The storage room should be provided with Mercury Spill Kit provision, proper ventilation (preferably with exhaust fan). The storage room needs to have smooth tiled floor with adequate slope, and lighting arrangement.

Disposal

Collected mercury waste should be handed over to the CBMWTF or the identified agency of the CPCB.


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DAYANANDA SAGAR COLLEGE OF DENTAL SCIENCES

MERCURY SPILLAGE PROTOCOL

MERCURY SPILL

KEEP CAUTION SIGN, WEAR PPE

USING SCOOP OR SYRINGE COLLECT AS MUCH OF MERCURY AS POSSIBLE

ADD SULPHUR AND CALCIUM HYDROXIDE ONTO THE SITE

BRUSH THE CONTAMINATED POWDER INTO THE SCOOP

ADD INTO THE BOTTLE AND CAP IT TIGHTLY

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Biological Spill Management

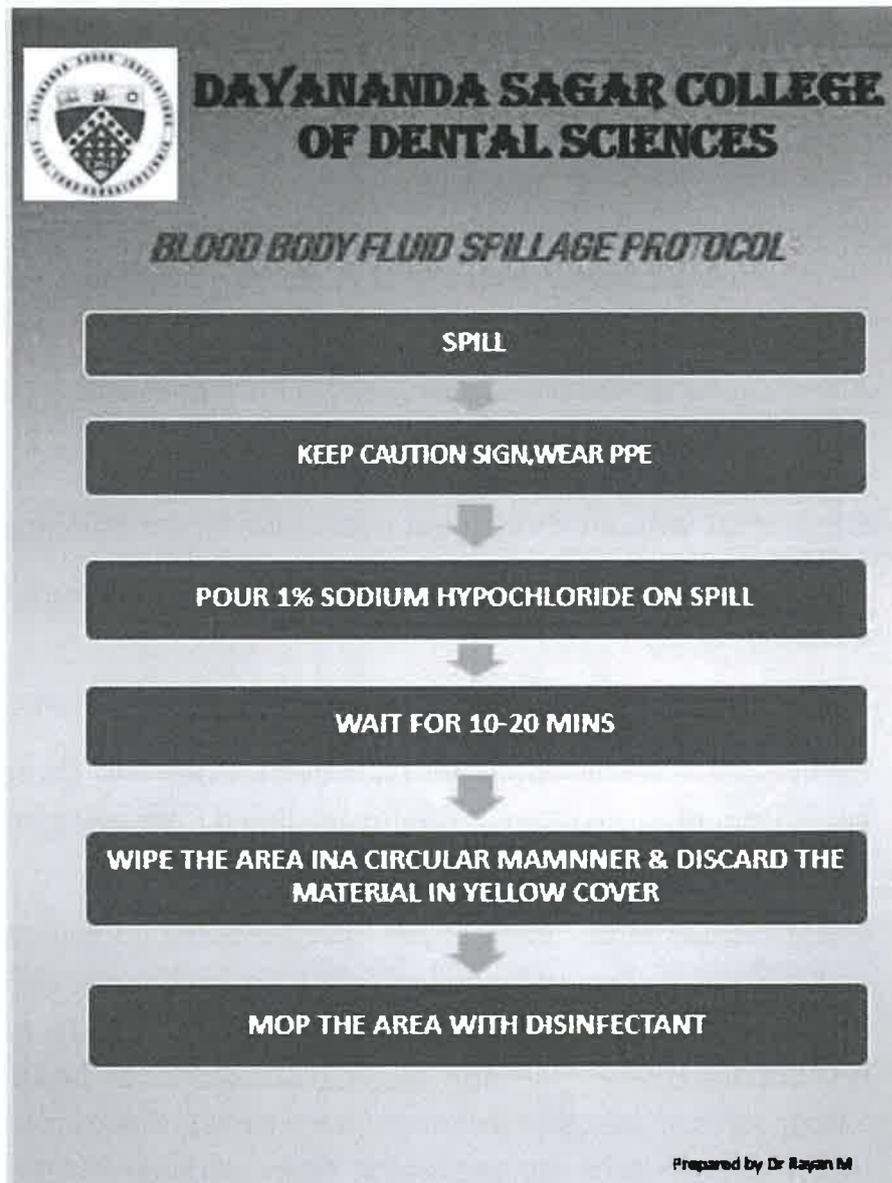
Small volumes (few drops) of Spills

1. Wear workman's gloves and other PPE appropriate to the task.
2. When sharps are involved use forceps to pick up sharps, and discard these items in a puncture-resistant container.
3. Cover the spill with a newspaper, blotting paper / paper towel or dry mud.
4. Wipe the spill with a newspaper moistened with hypochlorite solution (1% dilution containing minimum 500ppm chlorine). Discard the paper as infected waste. Repeat until all visible soiling is removed.
5. Wipe the area with a cloth mop moistened with 1% hypochlorite solution and allow drying naturally.
6. All contaminated items used in the clean-up should be placed in a bio-hazardous bag for disposal.

Large volumes (>10 ml) of Spills

1. Confine contaminated area
2. Wear workman's gloves and other PPE appropriate to the task
3. Cover the spill with newspaper or appropriate absorbent material to prevent from spreading
4. Flood the spill with 10% hypochlorite solution. While flooding the spill with 10% hypochlorite solution it is to be ensured that both the spill and absorbent material is thoroughly wet
5. Alternatively, chlorine granules can be sprinkled on the spill first and then the paper put over it
6. Wait for five minutes.
7. Remove and discard the paper as infected waste
8. Wipe the area with paper moistened with 10% hypochlorite again if required until all visible soiling is cleaned

9. Wipe the area once with 10% hypochlorite and a cloth mop and allow drying naturally
10. All contaminated items used in the clean-up should be placed in a bio-hazardous bag for disposal.



Fumigation/Fogging

Precautions to be taken

The following precautions should be taken while fogging:

- Replace formalin with safer agents like "an aldehyde based product containing Glutaraldehyde and chemically bound formaldehyde as principal disinfecting agents" e.g. Bacillocid.
- Advantages of these compounds are:
 - Has deep penetrating capability
 - Has no known resistant strains
 - Effective against Bacteria, Viruses, Mycobacteria, Amoeba, Fungi and spore forming organisms
- After fogging do the air sampling and keep the records.

Disinfection of OT without HVAC (heat ventilation air conditioning) system.

- After all cases are over, clean the OT as per the procedure for cleaning after all cases are over
- Keep ventilation system off (in case it is working). Turn the AC off
- Ensure all electronic equipment has been wiped and covered with a plastic cover (important to prevent the fogged liquid from going into the machines). No electronic equipment may be left uncovered
- Prepare solution of "an aldehyde based product containing Glutaraldehyde and chemically bound formaldehyde as principal disinfecting agents" e.g. Bacillocid* solution in the fogger tank (quantity as per manufacturer recommendations). Place the fogger in one corner of the OT (preferably near a door so it can be taken out easily) on a trolley. Place a double folded towel under the machine (to prevent it from slipping off as it vibrates when running)
- Direct the nozzle to the opposite corner of the room elevated at 45 degrees

- Start the fogger and close the OT
- Allow the fogger to run until a fog can be seen in the OT atmosphere. Check through the door window• Once a suspended fog is seen, wear a cap and mask, open the OT door, turn off the fogger and remove it to the outside
- Keep the OT closed for at least one hour**. It may be used any time after thi.

Note

- Inspect the floor for wet patches after opening the OT. All surfaces should be dry. If water deposits are present keep the OT closed to allow them to dry naturally (turn AC on if available). Do not wipe the water with sterile mop
- Check floor and working surfaces for excess stickiness (the foot slips or there are white streaks of deposit). This can be removed using soap and water. If excessive stickiness or deposits are observed, check the dilution of the cleaning and fogging solution and correct it if excess chemical was added during preparation. If the problem still persists, reduce the fogging time by 1-2 minutes and monitor.

Fogging of wards/rooms

Important: wards and rooms need not be fogged on a routine basis.

Fogging of wards and rooms should be done in the following situations:

- After an isolation ward/room is emptied at the end of an outbreak
- After an infected patient is discharged from a room (in absence of an outbreak)
- When an outbreak of infection occurs in a ward.

The general steps for cleaning and fogging of a ward/room are as follows:

- Wear cap, mask, gown and utility gloves. Arrange all cleaning material before beginning
- Perform thorough cleaning as mentioned for terminal disinfection
- First remove contaminated items, waste, linen, instruments to be cleaned

- Change the gloves and begin cleaning from periphery to centre. Move from clean to unclean areas and top to down. The general order would be doors, walls, windows and wall mounted objects, floor-based furniture and patient care items, attached toilets and lastly, floor
- After cleaning is over, close the windows and doors and fog the area with "an aldehyde based product containing Glutaraldehyde and chemically bound formaldehyde as principal disinfecting agents" e.g. Bacillocid* until a good fog is seen in the air
- Stop fogging, remove the fogger machine and keep the area closed for at least one hour**. It can be used after this


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STERILIZATION OF INSTRUMENTS

Sterilization: Sterilization is defined as a process of complete elimination or destruction of all forms of microbial life (i.e., both vegetative and spore forms), which is carried out by various physical and chemical methods.

STERILIZATION TABLE

Set pressure (kg)	Materials	Time of sterilization	Time of drying	Temperature
2+/- 0.1	Metal instruments	4 minutes	12 minutes	134 C
2 +/-0.1	Wrapped metal instruments	9 minutes	12 minutes	134 C
2 +/-0.1	Textile articles	12-16 minutes	12 minutes	134 C
2+/-0.1	Metal instruments	14-16 minutes	12 minutes	121 C
2+/-0.1	Textile articles	28-32 minutes	12 minutes	121 C

Note: The data in this table are only indicative choice.

Warning:

1. Check Pressure Gauge before opening the door. DO NOT open the door unless the pressure indicated is ZERO.
2. Use single power source at any time.
3. Pull off the Power Supply Plug from supply socket when the unit is not in use.
4. Keep the chamber clean.
5. Clean the silicon rubber gasket on the rear of the door and clean the front portion of the chamber before sterilization.

6 Equipment and personal safety requires following the above precautions.

7 10 minutes of cooling time shall be allowed between two successive cycles.

IMPORTANT NOTE:

Use only distilled water to avoid failure of this equipment. Using ordinary water would give rise to the formation of crusts and scales of salts on the coil and cylinder, causing frequent blockage of valves and inefficient heating, thereby requiring frequent servicing and also increasing the power consumption.

STEPS IN COLD STERILIZATION

{Always wear personal protective equipment, such as gloves, masks, protective eyewear, and a gown. Proceed slowly and carefully.}

STEP 1 TRANSPORT INSTRUMENTS TO STERILIZATION ROOM

STEP 2 HOLDING/PRESOAKING {If unable to begin the instrument processing procedure immediately}

STEP 3 SORTING OF INSTRUMENT

STEP 4 RINSING OF INSTRUMENT

STEP 5 CLEANING OF INSTRUMENT

Use a long handheld brush to help keep the scrubbing hand as far away as possible from sharp instruments. Place a maximum of 5 or 6 instruments in the pan and brush thoroughly while the instruments are submerged to avoid splattering.

STEP 6 THOROUGH INSPECTION OF INSTRUMENTS

STEP 7 SOAK IN KORSOLEX {DILUTION 20ML IN 1000 ML}

Make sure that all surfaces and openings of the instrument are completely covered with Korsolex solution.

High level disinfection for 20 minutes

Sterilisation - 2 hr

STEP 8 RINSE THE INSTRUMENTS THOROUGHLY WITH STERILE WATER.

STEP 9 DRYING /LUBRICATION OF INSTRUMENT

STEP 10 USE OR STORE INSTRUMENTS PROPERLY IN STERILE CONTAINERS.

AUTOCLAVE

Operating procedure

- 1 Plug the power supply into standard grounded 220v AC socket.
- 2 Open the door and pour the water from the given measuring jar such that the level of water completely submerges the heating coil.
- 3 Put the article in the sterilization box and place the tray into the chamber, then close the door and put the main circuit breaker switch.
- 4 Set up pressure control knob to the required pressure.
- 5 A} Sterilization time setting : Press "SET" KEY ONCE LED glows to indicate the sterilization mode, then use up & down keys to enter the required program. To save the programmed data press "enter" .
B} Dry time setting: Press the "SET" KEY twice to select the drying time mode and follow the procedure to set up as in sterilization time setting procedure.
- 6 Press START/STOP key to start the sterilization process. "RUN" LED starts to glow indicate this condition.
- 7 Pressure inside starts to build up on reaching set pressure, the pressure switch closes indicated by the beep sound.
- 8 When the chamber attains the required temperature, sterilization begins indicated by "STER" LED.
- 9 The process continues till the set sterilization time is reached.
- 10 During this process, the control unit maintains the same temperature & pressure throughout the set time.
- 11 After sterilization time, the dry cycle will start which is indicated by blinking the "DRY" and continues till the set dry time is reached.
- 12 Once the dry cycle is completed, "job over" LED glows along with the buzzer sound.

13 Now the door can be opened for removal of the sterilization articles.

Instrument Sterilisation Protocol

STEP 1 TRANSPORT INSTRUMENTS AND HANDPIECES TO STERILISATION ROOM

Used and contaminated instruments and handpieces should be transported to the processing area in a way that minimizes the risk of exposure to staff, patients and the environment. Once the instruments are finished being used in the operatory, they should be transported from the room in a closed container and the person who is transporting the instruments should be wearing appropriate personal protective equipment.

STEP 2 SORT INSTRUMENTS AND HANDPIECES –DISPOSE OF WASTE PROPERLY

Separate the reusable instruments from the disposables and remove the handpieces for sterilization. Disposable instruments should be properly disposed of and sterilized for reuse. Some instruments may require a cold soak prior to sterilization. If instruments cannot be cleaned immediately, pre-soaking or maintaining them in a moist environment may improve the cleaning process. Handpieces have a separate cleaning procedure prior to sterilization.

STEP 3 INSTRUMENTS SOAK, CLEAN AND DRY INSTRUMENTS

It is important to ensure that instruments are rinsed thoroughly and the majority of bioburden is washed off prior to placing them in an autoclave. Removal of debris may be easier if the instrument has had time to soften while in the holding solution. Visually inspect the instruments for residual debris, and damage and reclean or replace any instruments as appropriate. Hand scrubbing should be done carefully because of the risk of “sticks” from sharp instruments. Then, dry the instruments before packaging by allowing them to air dry by patting them down.

Handpieces: Wipe external surfaces and remove scaler tips. The tips should be removed from each handpiece. They should be properly cleaned and sterilized per the manufacturer’s requirements. The external surface of the handpiece should be wiped to remove any debris.

STEP 4 POUCH OR WRAP INSTRUMENTS

In order to prevent instrument recontamination, it is important to package items since placement of unwrapped sterilized instruments in a contaminated drawer, tray or other receptacle undermines the purpose of infection control. All instruments to be sterilized should be packaged in pouches or wraps unless they will be used immediately after sterilization.

STEP 5 STERILIZE AND DRY INSTRUMENTS IN AUTOCLAVE AS PER GUIDELINES.

STEP 6 STORE IN A DRY, PROTECTED AREA

Sterilised instruments should be stored in a clean, dry and protected place that has minimal airflow. Instruments should not be stored unpackaged as this will cause them to become contaminated from hands and airborne microorganisms when doors or drawers are opened. Packaging should be placed on clean shelves or in clean drawers. Instrument packages should be rotated on a "first in, first out" basis. To minimize the possibility of contamination, instruments should remain packaged until they are required for a procedure and the packaging intact. If the sterile barrier {packaging} has been punctured or gotten wet, the instruments should be re-sterilised.


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Biomedical Waste Segregation

Health facilities needs to streamline and standardize the entire activities required to manage waste right from its inception to its final disposal. This includes collection, transport, treatment and disposal of waste together with monitoring and regulation. It also encompasses the legal and regulatory framework that relates to waste management.

Implementation of BMW Rules

BMW management rules were revised through a gazette notification by the Central Government in 2016 & 2018 (Amendment) and it has become mandatory for health facilities to manage bio medical waste generated from the health facilities as per the new rules.

The bio medical waste as defined by the BMW Rules, 2016 is any waste which is generated during the activities of diagnosis, treatment and immunisation of human beings or any research activities pertaining thereto or in the production or testing of biological or in the health camps.

For implementation of the BMW Rules, 2016 & 2018 (Amendment) the health facilities need to be aware of the key changes that are incorporated in the BMW Rules vis-a-vis BMW Rules, 1998. The health facilities need to ensure that it has a copy of new BMW Rules for ready reference and as a guiding document for BMW management.

For implementation of the BMW Rules 2016 & 2018 (Amendment) the health facilities needs to ensure the following:

- Bio medical waste generated from the health facilities is segregated as per the new colour coding scheme specified in the BMW Rules, 2016 & 2018 (Amendment)
- All the health facilities which are situated within 75 km radius of Common Bio Medical Waste Treatment Facility (CBMWTF), need to have a formal agreement with the CBMWTF for final treatment and disposal of the bio medical waste

- Health facilities which do not lie within 75 km radius of CBMWTF need to have approval for deep burial pit, used for disposal of waste from the Pollution Control Board office
- Health facilities also need to ensure that the pre-treat the waste at the health facilities as per BMW Rules before handing over the same to CBMWTF or before the final disposal
- Each health facility also needs to ensure that only non-chlorinated bags (excluding blood bags) are used by the hospital for collection of waste in the hospital
- Health facilities also need to ensure that they monitor the activities of BMW management through a committee formed at the facility. This committee should meet at least once in six months and all the records related to the same need to be maintained by the health facility.

Segregation, Collection & Transportation of BMW

The key activities that a hospital performs for the management of BMW include segregation of the waste at the point of generation, timely collection of waste and transportation of the waste from the interim storage areas of the hospital to the central storage area and transportation of the waste from the central storage area to the deep burial pits (in case of facilities not having agreement with CBMWTF).

General Requirements

- It is imperative for healthcare organisations to segregate the waste generated from the facilities at the point of generation only
- Segregation of the waste is the responsibility of the waste generator only
- The waste generated from different areas of the hospital needs to be segregated as per the colour coding provided in the BMW Rules, 2016 & 2018 (Amendment).
- The general waste generated should not to be mixed with the bio medical waste.
- The work instructions are displayed at appropriate areas of the hospital for proper segregation of the waste as per the colour coding.

Segregation of BMW Waste as per BMW Rules, 2016 & 2018 (Amendment)

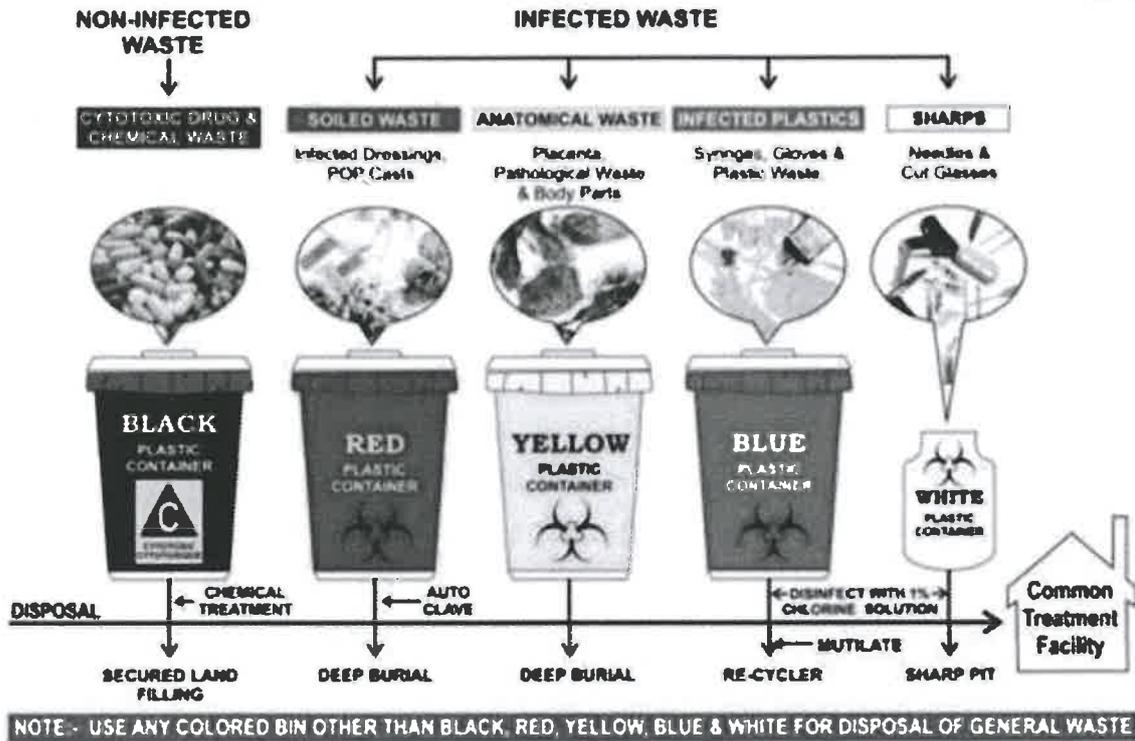
Category	Type of Waste	Colour & Type of Container
Yellow Category	Human Anatomical Waste Soiled Waste Discarded or Expired Medicine Chemical Liquid Waste Chemical Laboratory Waste Chemotherapy Drug Vials	Yellow colour non chlorinated plastic bags or containers
Red Category	Contaminated Waste (Recyclable)	Red colour non chlorinated plastic bags and containers
White Category	Waste Sharps including metals	White colour puncture proof, leak proof, tamper proof containers
Blue Category	Glassware Metallic Body Implants	Puncture proof and leak proof boxes or containers with blue coloured marking (2018 Amendment)

Waste water must also be disposed effectively since it can serve as a breeding ground for mosquitoes. People may also slip and fall in muddy puddles, and children may play in them and risk waterborne illness.

The area should be kept clean and planting of trees and plants should be encouraged.

Burning of plastic wastes is hazardous to human health and must not be practiced. Plastic bags must be segregated and recycled. If plastic is coming out of the patient care area, it needs to be disinfected by Chlorine Solution, and mutilated to prevent its re-circulation by unscrupulous element.

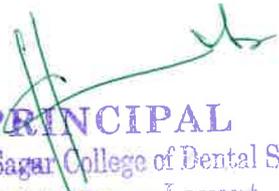
SEGREGATION OF SOLID BIO-MEDICAL WASTE




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References

- Health Technical Memorandum 01-05 – Decontamination in primary care dental practices (2013 edition).
- PCT Standard Precautions and Personal Protective Equipment Policy CLIN37.
- PCT Policy for Management of Clinical Sharps Injuries and Exposure to Blood and High Risk Body Fluids CLIN24.
- PCT Decontamination of Medical Devices Policy CLIN30.
- Indian Journal Of Forensic Medicine & Toxicology
- Biomedical waste management- An emerging concern in Indian hospitals
- Authors: Virendar pal sing, Gautam biswas, Jag jiv sharma
- Vol. 1 No-1 (2007/07 – 2007/12)
- Safety in healthcare who laboratories.
- Indian journal of medical microbiology - 2005 ; 23: 6-13
- Infectious Disease –Epidemilogy And Surveillance
- [www.cultureofsafety.](http://www.cultureofsafety.com/)
- <http://www.cloroxprofessional.com/>
- www.nyhealth.gov/nysdoh/environ/hsees/mercury


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